

ABSTRACT OF THE DISCLOSURE

A semiconductor doping process which enhances the dopant incorporation achievable using the Gas Immersion Laser Doping (GILD) technique. The enhanced doping is achieved by first depositing a thin layer of dopant atoms on a semiconductor surface followed by exposure to one or more pulses from either a laser or an ion-beam which melt a portion of the semiconductor to a desired depth, thus causing the dopant atoms to be incorporated into the molten region. After the molten region recrystallizes the dopant atoms are electrically active. The dopant atoms are deposited by plasma enhanced chemical vapor deposition (PECVD) or other known deposition techniques.

This enhanced doping will make possible the manufacture of:

- 1) active matrix flat panel displays on plastic substrates; 2) shallow junction formation for microelectronics on silicon, insulating or plastic substrates; and
- 3) junction formation for solar cells.